are of importance to the industry, and in particular for the publication monthly of a fishery journal containing all information in regard to scientific results, statistics, statutes, orders, foreign intelligence, commercial information, and all other information likely to be of benefit to those carrying on the industry.

(5) That the Fishery Departments and the Education Departments of the three kingdoms be requested to co-operate in providing a scheme of education on the general lines laid down in the report.

NOTES.

The British Association, as an outcome of the comprehensive review of scientific work during the war, which formed a conspicuous part of the programme of the recent meeting in Bournemouth, has addressed the following resolution to the Prime Minister and the Treasury:—"The British Association for the Advancement of Science, in reviewing the results of scientific method applied to military and other practical arts, recognises that the successful issue of the war has sprung from the efforts of scientific men concentrated on those problems, and with the conviction that the well-being and security of the nation are dependent on the continuous study of such matters, would urge on H.M. Government the necessity for apportioning an adequate sum from that allocated to home administration and the upkeep of the fighting forces for the purpose of a definitely organised scheme of research, as, for example, on problems connected with health, food, and commerce, on explosives, on chemical warfare, and on physical and engineering problems bearing on military work." Similar resolutions, in varying terms according to the special cases, have been forwarded to the First Lord of the Admiralty, the Secretary for War, the President of the Board of Trade, and the Ministers of Health and Food.

The appointment, as recently announced, of Prof. S. J. Chapman to be joint Permanent Secretary of the Board of Trade, owing to the transfer of Sir William Marwood to the Ministry of Transport, will be welcomed by all who know him. Prof. Chapman, who had held the professorship of political economy at Owens College, Manchester, since 1901, acted during the war as head of the temporary Industrial (War Inquiries) Branch of the Board of Trade, and in 1918 was appointed head of a new General Economic Department created for the purpose of assisting the Permanent Secretary in relation to questions involving economic policy. He is a fellow and member of council of the Royal Statistical Society, to the Journal of which, and to that of the Manchester Statistical Society, he has made numerous contributions bearing mainly on the cotton industry of Lancashire.

In the *Times* of October 11 is a letter from Prof. J. Johnstone on the subject of the extension of territorial waters in relation to deep-sea fishing. It is pointed out that the information at present available is not sufficient to enable satisfactory regulations to be drafted, and that, therefore, administrative authorities should not be given legislative powers which they cannot exercise properly. Prof. Johnstone also states that scientific investigation of our sea fisheries has never been properly organised and supported, and is in a worse condition now than it ever was. We agree with him that fishery investigations in this country have been quite inadequate, and we hope in the near future to see the establishment of an organisation for the comprehensive scientific study of the sea, so important for a great maritime nation, on a scale proportionate to the magnitude of our interests.

Changes in the Meteorological Office staff have recently been made, and the following appointments have been announced:—Mr. R. G. K. Lempfert becomes assistant director, and takes general oversight of observations and stations contributing observations to the Office. Mr. Lempfert entered the Meteorological Office in 1902, and has been superintendent of the Forecast Division since 1910. Lt.-Col. E. Gold becomes assistant director, in charge of forecasting. Col. Gold graduated as Third Wrangler in 1902, and was elected Fellow of St. John's College, Cambridge, in 1906; he was Schuster reader in dynamical meteorology from 1907 to 1910, and he then became superintendent of statistics at the Meteorological Office. On the formation of the meteorological section of the Royal Engineers in 1915 he was appointed to the command of the overseas contingent at G.H.Q., France. Capt. D. Brunt is made superintendent of the work for Army services. Capt. Brunt was in the meteorological section of the Royal Engineers during the war, and acted under Col. Gold. Mr. Carle Salter becomes superintendent on the staff of the Meteorological Office for the British Rainfall Organisation. Mr. Salter has recently been assistant director of the British Rainfall Organisation, which has now come under the control of the Meteorological Office.

In connection with the International Meteorological Committee, appointed by the International Conference at Innsbruck, 1905, a meeting of available members was held at the Meteorological Office, London, on July 3–9 last, and a copy of the minutes which have been printed has reached us. Since 1905 the committee has met in Paris (1907), Berlin (1910), and Rome (1913). The July meeting was of a semi-official character, and was really to prepare the way for the Paris meeting, which commenced on September 30. The president, Sir Napier Shaw, in his introductory statement directed attention to the changes caused by the great war, and especially to the new meteorological organisations developed. It was felt that the extent and detail of international co-operation must be much greater in the future than it had been in the past, but the problems are essentially of the same nature as formerly. The great development of aviation has introduced new requirements in respect of information concerning the upper air obtained by pilot-balloons or in other ways. The hours of observation for Europe were considered; 1h., 7h., 13h., and 18h. have become general, but it has been suggested that preference might perhaps be given to 3h., 9h., 15h., and 21h. Consideration was given to North Polar investigation in co-operation with Amundsen's expedition, and there was a proposal for the establishment of a meteorological station in the Island of Jan Mayen for observations from the summer of 1920 to the autumn of 1922. Necessarily much attention was devoted to the coding of messages and to the method and nature of the observations.

The Harveian Oration will be delivered at the Royal College of Physicians by Dr. Raymond Crawfurd on Saturday, October 18, at 4 p.m.

We regret to record that *Engineering* has suffered a severe loss in the death of Mr. B. Alfred Raworth, who had long been a member of the staff, and taken a prominent position in the editorial management during the past thirteen years. Mr. Raworth was a trained engineer, and had considerable experience prior to joining the staff of *Engineering* in 1882. He was a member of the Institution of Mechanical Engineers, of the Iron and Steel Institute, and of the Institute of Metals.

THE *Engineer* for October 16 records the death of Sir Charles Chadwyck-Healey, who had been intimately associated with our contemporary throughout the greater part of his life. Sir Charles was the only son of the founder of the *Engineer*, and was trained for the Bar, from which he retired after a successful career in 1893. During the war he performed a national service of great utility in fitting out at his own expense the hospital ship *Queen Alexandra*, and commanded her until she was discharged a few months ago.

WE regret to record the death, on October 5, of Mr. G. W. Palmer, who was appointed senior mathematical master and master of the Royal Mathematical School at Christ's Hospital in September, 1911. Educated at Dover College and Trinity College, Cambridge, Mr. Palmer did valuable work as mathematical master first at the Royal Naval School, Eltham, and afterwards at Clifton College, where he became head of the military side. An enthusiast in all matters educational, and a prominent member of the Mathematical Association, he kept in close touch with the best modern ideas on the treatment of his subject. Owing to his strong influence, more time was given to important principles and fresh ideas, while elaborate development in any one direction was avoided or postponed. The result has been that Christ's Hospital boys have shown increased interest in their mathematical work and a high general level of achievement—and this, too, without affecting the standard attained by boys preparing for the universities. During a brief reign of eight years Mr. Palmer accomplished a notable and valuable work of lasting benefit to Christ's Hospital. His death is a very severe loss to the school.

THE Society for the Prevention and Relief of Cancer has issued a pamphlet, "Cancer Research and Vivisection," summarising in tabular form the number of experiments returned by cancer institutes in the last fourteen years. The author holds that animal experiment in cancer is a futile waste of money, and ought to be stopped. Illustrations are reproduced showing infiltrative growth and metastasis-formation in experimental cancer, but the author suggests that experiment can throw no light on these conditions in the human subject. The aims of the society include the provision of hospitals for cancer patients, the statistical study of cancer, and legitimate (*sic*) experiment. No indication is given of what kind of experiments are contemplated, although needles and syringes for animal inoculation are figured in the book. Pamphlets have also been published on the use of violet-leaves and on the influence of tea-drinking. The society has been in existence for seven years, but its efforts seem to have had no effect on cancer mortality.

THE September–October issue of the *Scottish Naturalist* contains some extremely interesting notes by Mr. Donald Guthrie on the birds of South Uist. Among these, Mr. Guthrie remarks of the greylag goose that its wariness baffles description, yet goslings of this species which he hatched out from a clutch of eggs placed under a hen proved as amenable to domestication as ordinary tame geese. In their second year two females of this brood bred near the house without the slightest sign of shyness. A third disappeared for several weeks, then returned with a brood of goslings, and took up her place, accompanied by her family, with the fowls round the house. Her mate, who accompanied her, for a day or two held aloof, but on the third day took his place with the rest and stayed there. Having regard to the interest attached to the oft-discussed theme as to the origin of our domesticated geese, this case is worthy of note.

IN Report No. 1 of the Industrial Fatigue Research Board Dr. H. M. Vernon describes "The Influence of Hours of Work and of Ventilation on Output in Tinplate Manufacture." The tinplate industry is a very strenuous one, especially as concerns the millmen, for they are responsible for rolling out the red-hot tinplate "bars" into thin sheets of steel, which are afterwards tinned. The tinplate mills run continuously from Monday morning until Saturday afternoon, and, as a rule, the men work in eight-hour shifts. If there is a breakdown of machinery or shortage of material, the men are often put on to six-hour shifts instead, and sometimes even on to four-hour shifts, so as to give them all some employment. Consequently one is able to obtain trustworthy evidence as to the effects of such shortened hours on output. Arguing from numerous statistical data collected at a number of tinplate works, Dr. Vernon found that when the men were transferred to six-hour shifts their hourly output went up about 10 per cent., and when to four-hour shifts, it went up 11·5 per cent. This improvement is not so great as would be brought about by a thoroughly efficient system of ventilation, for it appeared that in works without artificial ventilation there was a marked seasonal variation of output, and in the hottest weeks of the year the output was 11–18 per cent. smaller than in the coldest weeks. In the ventilated factories the seasonal variation was much less, but even in them there was plenty of room for improvement. The report is illustrated by photographic reproductions of the millmen under working conditions.

ONE of the commonest and most disfiguring abnormalities of the modern mouth is a forward protrusion of the upper incisor teeth, with which is usually combined a retraction of the chin and a crowding of the lower incisor teeth. On this condition Mr. D. M. Shaw, curator of the Prosthetic Laboratories, Royal Dental Hospital of London, has recently thrown quite a new light (*Lancet*, August 23). He has shown that a certain "perverted functional activity" of the tongue will produce the series of anomalies which dentists have so often to correct in the mouths of modern children—forward protrusion and obliquity in the upper incisors, with retraction and uplift of the lower incisors. Mr. Shaw directs the attention of dentists to the strength with which the tongue can be made to press against the anterior part of the roof of the mouth, particularly behind the upper incisors, thus exerting a much greater power to produce deformity than is used by dentists to correct malposition of the teeth. Tongue-pressure of this nature is particularly common among children, especially when eating soft or pulpy food, being really a form of tongue mastication. This form of mastication appeals to children because it yields a fuller sense of taste if the food is sweet or agreeable than the legitimate use of teeth and gums. The point which is quite new in Mr. Shaw's demonstration is that during the palate-pressure action of the tongue the genio-glossus muscle exerts a retracting action on the chin region of the lower jaw.

A USEFUL article on "The Climate of Liberia and its Effect on Man," by Mr. Emory Ross, appears in the *Geographical Review* for June last. The passages on "European life on the West Coast" in general, on "tropical hygiene," and on "the nervous strain of the tropics" offer conclusive advice to those who may, in an idle moment, have thought of emigration. By immense efforts acclimatisation of the white man might be rendered possible, but at present his relation to the African West Coast "can be only one of tolerance."

The manganese ores of the Shimoga and adjacent districts are interestingly described by Mr. B. Jayaram, Senior Geologist to the Department of Mines and Geology of Mysore (Records, vol. xvi., part 2, 1917). The author suggests that percolating waters have brought the manganese, and the iron with which it is always associated, from the silicates of the basic chloritic schist series, and have deposited the ores as a replacement of the limestones and grits in which they are now found. The rocks termed limestone and grit are not true sediments, but secondary products of an igneous complex.

Attention was directed to the magnesite deposits of Canada in Nature, vol. c., p. 490, 1918. Those of Bulong, north-east Coolgardie goldfield, are now described by the Geological Survey of Western Australia (Bulletin 82, 1919). The magnesite, which is in numerous veins a few inches wide, has arisen from the decomposition of a great band of serpentine, and it is suggested that augite as well as olivine has supplied the magnesium required for its formation. The silica set free is probably responsible for the capping of "siliceous laterite, usually opaline in composition," which is stated to occur in the magnesite areas. The value of the magnesite is estimated at 1*l.* per ton on the ground, the export value being nearly 4*l.* per ton.

One of the means by which supplies of potassium compounds were eked out during the war period was the recovery of potassium salts from the flue-dust which occurs as a waste product in the manufacture of Portland cement. The principal methods employed depended upon treatment of the flue-gases by water-sprays or by a process of electrical precipitation. An account of the various installations devised for the purpose has been published by the Department of Mines, Ottawa (Bulletin No. 29, "Potash Recovery at Cement Plants"). It contains descriptions of the recovery systems developed at a number of cement factories in the United States, together with an historical review of the whole question and full references to the literature of the subject.

Attention may be directed to a useful series of articles on the mechanical handling of chemical materials, by Mr. G. F. Zimmer, which have recently appeared in the *Chemial Age* (Nos. 10 to 15). It has been remarked that chemical works in this country are rather poorly equipped with labour-saving machinery. In present circumstances, when the cost of manual labour has increased so greatly, it may be necessary to pay more attention than formerly to devices which will reduce this cost. The articles in question will help to show how this may be done. They are illustrated, and well worth consulting by chemists in charge of factories.

Messrs. Lumière and Seyewetz have published in the *British Journal of Photography* (October 3, Colour Supplement) a simplified method for the development of autochrome plates. The developer is prepared of two degrees of concentration, so arranged that if the weaker is applied first to the plate, the time that is taken in producing the first outlines of the image (neglecting the sky) will be exactly the time that the stronger solution will require to complete development. Although a watch or clock may be used for the timing, a simple sand-glass has many advantages. The sand is started running when the weaker solution is applied, then on the first appearance of the image the glass is put on its side; the weaker solution is poured off and the stronger poured on, and the sand-glass put upright. When the sand has flowed back again the development is complete. In the formula given the concentrations of the developers are as 1 to 10.

Sir Charles Bright read a paper on "Inter-Imperial Communication, through Cable, Wireless, and Air Methods," before the Section of Economic Science and Statistics at the Bournemouth meeting of the British Association. He pointed out that it is conceivable that national and imperial interests can be adequately provided only by the State controlling at least one complete cable to all points of the British Empire, supplemented by an all-British wireless chain. The recently established Telegraph Communications Board, first urged by the author seventeen years ago, is intended for generally controlling and developing inter-imperial telegraphic and aerial communication in national and public interests. By this scheme all the Government departments concerned (strategic as well as civil) are represented by delegates, who meet periodically to discuss and settle all matters germane to the subject. This should do much towards improving the previously existing arrangements by which the Post Office alone represented the Government. Besides increased cable and wireless facilities being necessary and the war devastations made good, it is highly desirable that improved methods of message condensation should be introduced so as to get the best results from existing facilities. The field open to inter-imperial air communication is considerable; air organisation and air routes are amongst the important questions of the day, and it is suggested that all aerial mail communications should be rationed.

An important paper on the theory and use of radio-direction-finding apparatus by Capt. A. S. Blatterman, of the U.S. Army, appears in the Journal of the Franklin Institute for September. It is known that in radio stations it is sometimes possible to hear signals when the antenna is disconnected from the apparatus. Hence the passing waves induce sufficient electromotive forces in the coils of the receiver to produce audible signals. An investigation was therefore carried out in the U.S. radio laboratories in 1917 and 1918 to find out the most efficient shape of coil to receive signals directly. As the loudness of the signals varies with the position of the coil, an investigation was also made of the most efficient shape of coil for direction-finding. Elementary theory would lead us to suppose that the coil would be more effective the larger its cross-section and the greater its time-constant. It would also appear that the loudness of the signals is inversely proportional to the square of the wave-length. This, however, is not the case. The experiments recorded in this paper prove that there is a certain size of coil which gives the best results for a given wave-length. This was traced to the fact that the resistance of the coil varies with the wave-length. For very long wave-lengths the resistance has its ordinary value. As the wave-length is shortened, and therefore as the frequency is increased, the resistance increases slowly until it is two or three times its ordinary value, and it then increases with great rapidity. This effect makes the reception bad at high frequencies. There is, therefore, a certain sized coil which produces the best effects. The results of the experiments described prove this conclusively. A thorough investigation is also given of the directional characteristics of this type of receiver, and many curious properties depending on its height above the ground were discovered. Using a properly constructed coil in an ordinary room and a seven-stage amplifier, the signals issued by all the high-power European stations could easily be heard.